WHAT DO WE KNOW ABOUT FREAQUE WAVES IN NATURE? – AN EMPIRICIST'S VIEW

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There are always freaque wave encounters being reported in the news all around the world. However, regardless of when or where it was reported as taking place, the question posed by the title of this paper is really predicated by another rather more fundamental question: Do we really know what kind of freaque wave was encountered?

Frankly, the answer must be no! We know that something happened, but no one really knows what, why, or how it happened.

Encounters are reported quite frequently nowadays. Freaque waves (freak or rogue waves) have become somewhat of a standard nomenclature being used in news reports to describe any kind of wave-related incident. So generally, we know something happened, but most likely we have no way of knowing what kind of wave condition it was, why, or how it was encountered.

For instance, in the case of the Cruise Ship MS Louis Majesty that encountered freaque waves in the northern Mediterranean near Marseille, France in early March 2010. As was reported in news reports worldwide, two passengers were swept to their death, and as many as 14 were injured when freaque waves crashed into a vessel that was carrying 1,350 passengers and 580 crew members. According to a Louis Cruise Lines spokesman the ship was hit by three "abnormally high" waves up to 26 feet high that broke glass windshields in the forward section. The waves hit as high as deck 5 on the 10-deck ship.

All kinds of news reports and commentaries on this case have been published online or in print since then. At one time, Google Search indicated that there were about 1,300 articles available. Unfortunately, despite all of those reports, some complete with eye witness interviews and "expert" opinions and analysis, there was no clear information regarding wave conditions beyond the cruise ship spokesman's announcement of three 26 feet high waves.

So in this case, as in many other cases, we know freaque waves were probably encountered, but we don't know the details of how, what, and why!

How do we perceive freaque waves?

We generally gather information about freaque waves from three different perspectives:

- From eyewitness accounts of actual encounters – Testimonial.
- From available in-situ wave measurements – Empirical.
- From academic theoretical formulations – Conjectural.

The responses from the three different perspectives will undoubtedly be different and have very few similarities between them.

The state of freaque wave studies

Testimonial accounts are probably the most widely known and, at the same time, the most uncertain. Empirical recordings are the weakest link in general freaque wave studies. There is no wave measurement equipment that was ever implemented for the specific purpose of recording and studying freaque waves. Academic theoretical studies are presently the strongest component, and perhaps the most credible aspect, of current freaque wave studies.

There are two factual elements that perhaps serve to sustain the conventional freaque wave studies. The first is the nearly universal recognition of the abnormal wave form recorded on the North Sea Draupner Platform of Statoil on 1995 New Years day, widely known as the Draupner wave, as the standard portrait of freaque waves. And the second is that most of the theoretical efforts have been primarily targeted at establishing or stimulating the Draupner-type freaque wave condition. While these two elements practically permeate most of the freaque wave research studies, it needs also to point out that no one knows if Draupner type waves really represent the kind of freaque wave people encountered in the open ocean. We simply cannot ascertain at the present time if freaque wave encounters, wherever or whenever they may occur, will be similar to Draupner-type freaque waves. So

any implication or expectation of linkage between them would be a giant leap of faith without any realistic or factual basis to justify it. So successful theoretical simulation of Draupner type waves does not necessarily imply further understanding of freaque wave processes. The theoretical knowledge of the physics involved in developing/simulating presumed freaque wave forms CANNOT substitute for practical knowledge of how freaque waves occur in the ocean and lakes. One is fact, whereas the other is just an expectation. The fact is that freaque waves have occurred in the ocean. The expectation, on the other hand, is a subjective personal viewpoint to regard freaque wave occurrence according to the theoretical simulation process.

In general, the essence of the theoretical conjectures is hinged at a Draupner-type wave form that is the result of wave measurement at a single point location. The vast ocean wave processes are by no means single point processes. So in the end, one is still confronted with the nagging question regarding what exactly we are striving to achieve in the first place.

What is needed?

What is needed now may be a question that, again, has different answers for different incentives. For furthering understanding of freaque waves in the oceans, we wish to make the following suggestions as next steps to move away from our current state of stagnation:

- Develop spatial wave measurement.
- Make long-term wave measurement at most of the available platforms in the world's oceans.
- Equip all large ocean-going vessels with wave measuring devices to record wave conditions at all times.

If these modest steps can be implemented, there will be an exciting new world of ocean wave studies in store for us. Comprehensive studies will be based on facts rather than probability. When unknowns become known, all are expected, and nothing is unexpected. So in the brave new world, all waves will likely be integral parts of the oceans and lakes, none will be banished as "freaque" anymore!

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